

[0064] As described above, the portable terminal 200 comprises first and second housings 201 and 202, wherein the second housing 202 is connected to the first housing 201 through the hinge device 100, so that the second housing 202 is opened or closed above the first housing 201 while being rotated about the first and second hinge axes A1 and A2.

[0065] The front face of the first housing 201 is provided with a key pad 211 and a transmitter part 213, and a hinge arm 215 is provided at the top edge of the first housing 201. In addition, the second housing 202 is mounted on a part of the second connection shaft 104 and the fastening piece 105. One surface of the second housing 202 is provided with a display device 221 and a receiver part 223.

[0066] At this time, even if the hinge device 100 interconnects the first and second housings 201 and 202, the second hinge base 102 is partially exposed. Referring to FIG. 2, a hinge cover 203 and a cover member 231 are mounted over the exposed part of the hinge device 100, thereby protecting the exposed part.

[0067] If the second housing 202 is folded over the first housing 201, the first and second escaping grooves 137 and 147 are engaged with each other. Therefore, the second hinge base 102 is rotatable about the first hinge axis A1 or the second connection shaft 104 is rotatable about the second hinge axis A2.

[0068] If the second housing 202 rotates about the first hinge axis A1 as shown in FIG. 9, the second hinge base rotates about the first hinge axis A1 and the second connection shaft 104 swivels around the first hinge axis A1, whereby the second escaping groove 147 moves in the direction of wrapping the peripheral surface of the support part of the first connection shaft 103. Accordingly, the rotation of the second connection shaft 104 about the second hinge axis A2 is limited. Likewise, if the second housing 202 rotates about the first hinge axis A1, the rotation about the second axis A2 is limited.

[0069] If the second housing 202 is rotated about the first hinge axis A1 and extended, the second housing 202 is positioned above the top side of the first housing 201, whereby the distance between the transmitter part 213 and the receiver part are maximized to be suitable for voice communication.

[0070] FIGS. 10 and 11 show the state in which the second housing 202 is rotated about the second hinge axis A2 from the state of being folded on the first housing 201. More specifically, FIG. 10 shows the second housing 202 in the state in which the second housing 202 has been rotated and stopped so that the second housing 202 is unfolded about 150 to 170 degrees from the first housing 201. FIG. 11 shows the second housing 202 rotated and stopped, so that the second housing 202 is unfolded about 180 degrees.

[0071] When the second housing 202 is folded onto the first housing 201, the stop groove 142 and the stop ball 151 are engaged with each other. By the stop groove 142 and the stop ball 151 being engaged with each other, the second housing 202 is stably maintained in the position of being folded on the first housing 201.

[0072] Even if the second housing 202 is unfolded about 150 to 170 degrees from the first housing 201, another stop groove (not shown) formed on the second connection shaft 104 and the stop ball 151 are engaged with each other, whereby the second housing 202 is stably maintained in the state in which the rotation of the second housing 202 is

stopped. If plural stopper grooves 142 are formed, it will be possible to set the angle selectively to stop the rotation of the second housing 202 when the second housing is unfolded about 150 to 170 degrees from the first housing 201.

[0073] When the second housing 202 is extended 180 degrees from the first housing 201 as shown in FIG. 11, the other face of the second housing 202 and the front face of the first housing 201 interfere with each other, thereby limiting the rotation of the second housing 202.

[0074] If the second housing is rotated about the second hinge axis A2 as shown in FIG. 10 or FIG. 11, the second housing is located at a lateral side of the first housing 201. At this time, the user positions the terminal 200 crosswise, so that a multimedia file or the like can be viewed through the display device 221. In addition, if the key pad 211 provided on the first housing 201 has a QWERTY key arrangement like a key board arrangement of a personal computer, it is possible to conveniently input various information.

[0075] Meanwhile, when the second housing 202 rotates about the second hinge axis A2, the second connection shaft 104 also rotates about the second hinge shaft A2, whereby the rotating part 141 is moved to a position where the peripheral surface of the rotating part 141 is wrapped by the first escaping groove 137. In addition, the guide projection 149 is also moved to a position where the guide projection 149 is engaged with the guide groove 139. Therefore, the second connection shaft 104 and the second hinge base 102 cannot rotate about the first hinge axis A1. Consequently, the second housing 202 rotates about the second hinge axis A2, the rotation about the first hinge axis A1 is limited.

[0076] As described above, a portable terminal with the inventive dual axis hinge device has a pair of hinge axes which are extended perpendicular to each other, so that one housing can be positioned at the top side or lateral side of the other housing, whereby it is convenient to use the portable terminal. In addition, when one housing is positioned at the top side or lateral side of the other housing, the rotation of the one housing is limited in any direction, except in the directions of folding the one housing onto the other housing or rotating the one housing away from the other housing, whereby the structural stability and reliability of the terminal can be secured.

[0077] While the invention has been shown and described with reference to certain preferred embodiments thereof, various changes and modifications can be made without departing from the scope and spirit of the present invention as defined by the appended claims. Therefore, the scope of the present invention shall be determined by the appended claims and equivalents thereof rather than by the embodiments described above.

What is claimed is:

1. A portable terminal comprising:

a first housing;

a second housing rotatably connected to the first housing to be capable of being moved between an open and closed position with respect to the first housing; and

a hinge device interconnecting the first and second housings, the hinge device providing first and second hinge axes extending perpendicular to each other,